A Successful 15-Year Experience in Double-Dome Tip Surgery via Endonasal Approach

Nuances and Pitfalls

Stephen W. Perkins, MD; Mark M. Hamilton, MD; Kate McDonald, RN, BSN, AORN, RNFA

Background: Endonasal double-dome techniques provide a reliable method to approach the nasal tip.

Objectives: To review one surgeon’s 15-year experience using a graduated method of endonasal double-dome tip surgery including patient selection, intraoperative techniques, and postoperative complications and to emphasize the nuances to achieve symmetry and consistent results.

Patients and Methods: Three hundred eighty-six patients who had adequate follow-up after undergoing endonasal double-dome tip rhinoplasty.

Results: Results at 1 year showed high rates of supratip (94%), dome (96%), and nostril (88%) symmetry. There was a high rate of patient satisfaction with a low rate of revision (7%).

Conclusion: Endonasal double-dome tip surgery provides the surgeon the ability to achieve consistent results with high patient satisfaction and a low rate of revision.

Arch Facial Plast Surg. 2001;3:157-164

The most challenging part of rhinoplasty is the nasal tip. Endonasal delivery techniques have an extensive and successful history. Since its introduction, open structure rhinoplasty has gained increased recognition as reportedly a more reliable technique. In this article we will demonstrate the simplicity of endonasal double-dome tip surgery and show how in one surgeon’s (S.W.P.) hands it has proven reliability with consistent results and a low rate of revision.

Achieving tip definition has evolved since cosmetic rhinoplasty began with Joseph in the late 1800s. Tebbetts describes this evolution. Initially, nasal tip-shaping techniques were destructive, consisting of mostly incising and resecting cartilage. This resulted in consistent loss of nasal tip support and increased the risk of secondary deformities. Then came the era of open structure rhinoplasty with the routine use of tip grafts. This increased the number of variables in a surgery in which the normal anatomical structures could produce the same or better results. Now we have evolved into an era of nondestructive tip-shaping techniques. These methods allow achievement of the desired aesthetic appearance while maintaining functional support. This assures excellent results, not just at 1 month, but also at 1 year, 5 years, 10 years and more.

Our approach is based on the creation of the double-dome unit as described by McCollough and English. In addition, individual treatment of each dome to create the correct contour is further refined. If traditional techniques of morselization and scoring are unsuccessful, a suture can be used to achieve the “ideal” single dome prior to double-dome reconstitution (Figure 1).

These techniques are not for all patients. Tardy et al list the ideal patient characteristics for suture techniques. The ideal patient has a bifid, broad, or even trapezoidal nasal tip. Thin skin and sparse subcutaneous tissue are more appropriate for these refined techniques. The alar cartilage itself must be firm and strong. Finally, the alar sidewalls should be thin and delicate. Patients do not necessarily need to have any or all of these characteristics. By using the endonasal approach and a progressive method with each tip, an aes-
PATIENTS AND METHODS

A total of 1282 medical records of patients who had nasal surgery by one of us (S.W.P.) between April 1, 1983, and April 1, 1997, were retrospectively reviewed. Of these patients, 822 had tip-altering procedures as part of their nasal surgery. Of these, we selected those patients who had endonasal double-dome tip rhinoplasty and at least 1-year follow-up. A total of 386 patients qualified for this study.

Supratip, tip, and nostril symmetry were evaluated from slides taken at the 1-year point. All evaluations were done by one of us (M.M.H.). Judgment was made as to whether symmetry had been achieved.

Final results from the patients' most recent visit were evaluated in a similar manner as done at the 1-year point. If supratip, tip, and nostril symmetry had been achieved, the patient was judged to have had a satisfactory surgical result. In addition, office notes from this most recent visit were reviewed to determine patient satisfaction. Length of postoperative time (in months) from the initial surgery was also recorded.

Revision rates were determined to further judge consistency. A determination was made from operative reports as to whether the patient had tip, dorsum, or septal revision work.

The delivery approach is begun by first making either a complete transfixion incision or a high septal transfixion depending on tip projection (Figure 2). Curved sharp scissors are then used to dissect up over the anterosuperior septal angle and expose the upper lateral cartilages. Next intercartilaginous and marginal incisions are made in a standard fashion. Thin Metzenbaum scissors are then used to separate the overlying skin from the underlying lower lateral cartilages. Finally, the alar domes are delivered with a single hook and supported with the Metzenbaum scissors. In this fashion each dome is assessed and recontoured individually (Figure 3).

The first step to achieving improved definition is removal of the fibrofatty tissue between the domes. This allows greater approximation of the 2 alae. An intact or complete strip is performed next by excising the cephalic portion of the lateral crura. This achieves both volume reduction and improved supratip definition. It is essential to preserve at least a 7- to 9-mm width of cartilage. The cartilages can be repositioned in situ. In a few select cases, this may be all that is required. Most often, however, satisfactory tip symmetry and definition have not been achieved, and further refinement and stabilization is required.

If the contours of the domes need refinement, either suture techniques or morselization may be used. The goal with morselization is to lightly crush the cartilage enough that a more acute angle is created at the domal junction. This technique of “pinch” morselization is reserved for very strong wide domes. A great deal of finesse is required to achieve the desired contour without breaking the cartilage. Because of this, suture techniques are favored.
The ideal alar configuration has been described as when the domal segment is convex, the adjacent lateral crura is concave, and the overlying soft tissue is thin. The safest method of achieving ideal domal configuration is with suturing. This allows preservation of cartilage strength and resiliency. Prior to placing the suture, the vestibular skin is separated from the undersurface of the domal cartilage (Figure 4). A 5-0 absorbable synthetic polyglycolic acid (Dexon) mattress suture is placed at the junction of the lateral and medial crura (Figure 5). This is where the individual tip-defining point is refined. The knot is tightened to the point where the proper amount of domal definition is achieved.

If tip asymmetry exists or supratip definition requires more refinement, the stronger dome can be trimmed. This is typically done by “beveling” the cephalic portion of the dome to match the opposite dome (Figure 6).

With achievement of symmetrical, aesthetically pleasing individual domes, the entire tip is reevaluated. By using the endonasal approach, this continual critiquing can occur. A double-dome stitch or transdomal mattress suture is next used to bring the individually defined domes together and to stabilize these into 1 unit. Stabilization is the key for long-term predictability of symmetry and maintenance of long-term results. The suture is placed horizontally through the lateral and medial crura of both domes. A 5-0 clear polypropylene (Prolene) suture is typically used. Varying the tension on the suture can alter the amount of lobule narrowing desired. By replacing the domes, the amount of narrowing achieved can actually be visualized as one ties the knot (Figure 7). It is essential to avoid cinching the suture down to avoid creating a unitip appearance.

At this point the tip is reevaluated. Minor asymmetries can first be addressed by removing or replacing the double-dome mattress suture. It is possible to adjust one dome to the other by alterations in placement of the double-dome stitch. Next, excising or recontouring cartilage above the sutures can be used for more minor asymmetries. Following achievement of a symmetrical and well-defined tip, attention is then turned to the septum, the dorsum, and osteotomies. A columellar strut fashioned from septal cartilage is placed between the medial crura and anterior to the nasal spine prior to osteotomies. Intranasal incisions are closed with 5-0 catgut. In closing marginal incisions it is important to avoid the lateral crura when suturing. Retraction of the lateral crura could lead to possible alar collapse and a more pinched tip or nostril asymmetries.

A small rolled piece of absorbable oxidized regenerated cellulose (Surgicel) is placed inside the nose within the vestibule of each newly constructed dome to add stability and prevent hematoma. Tan surgical tape (Micro-
pore) along with an alloy metal splint is used for the external dressing that is removed at 1 week.

RESULTS

A total of 386 patients (297 females and 89 males) underwent endonasal double-dome tip rhinoplasty and had adequate (1-year) follow-up. Average follow-up was 17 months.

Dome symmetry was present in 371 patients (96%) at 1 year. Supratip symmetry was found in 362 patients (94%) and nostril symmetry in 335 patients (88%). There were a total of 47 revisions. In 27 of these revisions, tip work was performed. Twenty-two revisions involved work on the dorsum and 2 involved work on the septum. Overall the percentage of patients required revision tip surgery was 7%.

Final results were determined from the most recent follow-up (following any revision). Patients were judged to have a satisfactory result if tip, supratip, and nostril symmetry had been achieved. Also, patient satisfaction was determined from the most recent office note. A satisfactory aesthetic result as well as patient satisfaction were obtained in 357 patients (92%). In 13 patients (3%) an unsatisfactory aesthetic result persisted, but the patient remained satisfied. In 11 patients (3%) it was believed that a satisfactory aesthetic result was achieved, but the patient remained dissatisfied. Finally, in 5 patients (1%), a less than completely satisfactory result was obtained and the patients were satisfied. These results were seen across a variety of nasal tip deformities (Figures 8, 9, 10, and 11).

COMMENT

Nasal tip surgery has evolved into a philosophy of preservation of normal anatomy. Endonasal double-dome techniques offer methods that follow this principle. The
merits of these techniques are many. By using the endonasal approach, results of individual steps can continuously be reevaluated. Normal anatomy is used instead of newly created grafts that increase the possibility of secondary deformities. The procedure is performed in incremental steps, most of which are reversible.

Figure 9. Preoperative (A and B) and postoperative (C and D) views of a patient whose bifid tip was reconstructed.
The success using these techniques is demonstrated here. In a large series of 386 patients with long-term follow-up, excellent results were consistently achieved. Supratip, tip, and nostril symmetry were achieved 96%, 94%, and 88% of the time, respectively. Nasal tip revisions (7%) were infrequently needed in a

Figure 10. Preoperative (A and B) and postoperative (C and D) views of a patient whose bulbous tip was reconstructed.
study in which only patients with long-term follow-up were included. Finally, patient satisfaction remained high (95%) even years after the surgery.

The disadvantages of these techniques include the need for greater surgical finesse in delivering and suturing the alar cartilages. Also these techniques are not as
effective in those with thick skin or with thin, frail alar cartilages. Nevertheless, for most cosmetic tip rhinoplasties, endonasal double-dome techniques provide consistent results and few complications.

Accepted for publication March 14, 2001.


Corresponding author and reprints: Mark M. Hamilton, MD, Meridian Plastic Surgery Center, 170 W 106th St, Indianapolis, IN 46290 (e-mail: mmackhamilton@aol.com).

REFERENCES


Quotable

Change

Change is one of the most exciting aspects of life; without it life could be pretty dull. Meeting change in a professional life can be disruptive, or it can be a thrilling experience if one anticipates change and adapts to it. Change can penetrate all aspects of medical care from the site of practice, skills, and equipment required to deliver the new skills. Failure to adapt to change can render a physician unhappy and ineffective. Some of the changes witnessed in my lifetime include the following:

* Office calls at 50 cents per visit, including minor surgery
* House calls (via horse and buggy) at $1.00 (all practice needs contained in a black bag)
* Introduction of antibiotics and other pharmaceutical discoveries
* X-rays and other forms of imaging
* Cancer treatment advancements
* Group practice and the rise of medical and surgical specialties
* Introduction of nonphysicians in the delivery of health care
* Changing role of hospitals in the delivery of health care, including nursing homes, rehab centers, etc
* Introduction of fiber optics and other diagnostic and treatment tools
* Use of computers, fax, e-mail and other electronic devices
* Insurance coverage and managed care

This is a small list of changes that required some form of adaptation and does not include the expansion of medical knowledge, which is happening continuously. How could one live through these changes without being excited!

Howard W. Smith, MD